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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,385	12/27/2005	Mamoru Yasuda	0388-052976	8154
28289 7590 12/21/2007 THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219			EXAMINER MILLER, ROSE MARY	
			ART UNIT 2856	PAPER NUMBER
			MAIL DATE 12/21/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<div style="border: 1px solid black; width: 150px; height: 20px; margin: 0 auto;"></div> <p style="text-align: center;"><b>Office Action Summary</b></p>	<b>Application No.</b> 10/562,385	<b>Applicant(s)</b> YASUDA ET AL.	
	<b>Examiner</b> Rose M. Miller	<b>Art Unit</b> 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10/9/07, 12/11/06, & 12/27/05.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4 is/are allowed.
- 6) ☒ Claim(s) 5 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/11/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because empty diagram boxes are impermissible under 37

CFR §1.83(a) which recites as follows:

*"The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a **labeled** representation (e.g., a **labeled** rectangular box)." (Emphasis added by Examiner)*

The empty diagram boxes 8a and those found in 81, found in Figure 5 of the drawings, must be labeled with an appropriate descriptive phrase or legend in addition to the reference character already present. Please see 37 CFR §1.84(n), 37 CFR §1.84(o), and 37 CFR §1.83(p) for more information on the difference between the required legends and the reference characters already present. Appropriate correction is required.

Replacement drawing sheets including the correction are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Specification*

2. The abstract of the disclosure is objected to because legal phraseology such as "comprising" is not permitted in the abstract and the abstract should be a single paragraph. Correction is required. See MPEP § 608.01(b).

3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

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As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

4. While the Examiner cannot require Applicant to place the Specification in the above order, it is highly suggested that Applicant follow the above guidelines and re-write the specification accordingly.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by **Koichi et al. (JP 11248737)**.

**Koichi et al.** discloses in Figure 4 a vibration sensor comprising a fixed electrode (31, 32), and a diaphragm electrode (15) having a weight member (11b, 12b) attached to a

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membrane surface facing away from the fixed electrode (see Figures) and fixedly supported at peripheries thereof (inherent in use of membrane – see Figures), the vibration sensor being capable of outputting variations of capacitance between the fixed electrode and the diaphragm electrode (see Abstract) as vibration signals, wherein the weight member (11b, 12b) includes a corner portion (see Figure 4) contacting the diaphragm electrode (15) and having a sectional shape forming an obtuse angle (weight portion 12b forms an obtuse angle with membrane – see Figure 4) with the membrane surface of the diaphragm electrode.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hideyo et al. (JP 20011267588)** in view of **Katsuo (JP 59-079700)**.

**Hideyo et al.** discloses a vibration sensor (see Figures) comprising a fixed electrode (2a), and a diaphragm electrode (4), the vibration sensor being capable of outputting variations of capacitance between the fixed electrode (2a) and the diaphragm electrode (4) as vibration signals, wherein the diaphragm electrode (4) includes a corrugated portion (4b) between an inner portion of the electrode an outer portion which is fixedly supported.

**Hideyo et al.** discloses the claimed invention with the exception of the diaphragm electrode of the vibration sensor including a weight member attached to a membrane surface facing away from the fixed electrode and wherein the diaphragm electrode the corrugated portion of the diaphragm electrode lies between an inner portion where the weight member is attached and an outer portion fixedly supported.

**Katsuo** teaches that a weight (6a) attached to near the center of the electrode on one side of the moveable electrode (diaphragm electrode 6) improves the sensitivity of the vibration detector by in increasing the mass of the moveable electrode.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to improve the sensitivity of the vibration sensor of **Hideyo et al.** by placing a mass in the center of the diaphragm electrode such that the corrugated portion of the diaphragm lies between the inner portion of the electrode where the weight is attached and the outer fixedly supported portion of the diaphragm electrode as **Katsuo** clearly teaches that the attachment of a weight to the center of the moveable electrode is a simple means of improving a

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capacitive vibration sensor consisting of a fixed electrode and a moveable (diaphragm) electrode.

***Allowable Subject Matter***

11. Claims 1-4 are allowed.

12. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach and/or suggest a capacitive vibration sensor comprising, in combination with the other recited elements, a weight member attached to a membrane surface of the diaphragm electrode facing away from the fixed electrode and fixedly supported at peripheries thereof, especially wherein the vibration sensor further comprises projecting portions formed on parts of an end portion of the weight member to project along a direction of the membrane surface and spaced from the membrane surface of the diaphragm electrode, and a restricting member for contacting the projecting portions of the weight member displaced along the direction of the membrane surface of the diaphragm electrode thereby to restrict displacement of the weight member.

The prior art of record also fails to teach and/or suggest a vibration sensor comprising, in combination with the other recited elements, a weight member attached to a membrane surface of the diaphragm electrode facing away from the fixed electrode and fixedly supported at peripheries thereof, especially wherein the vibration sensor further comprises restricting members for contacting an end portion of the weight member displaced along the direction of the membrane surface of the diaphragm electrode, thereby to restrict displacement of the weight member, the restricting members being formed on parts opposed to the end portion of the weight member and spaced from the membrane surface of the diaphragm electrode.

The closest prior art teaches the use of a weight in a capacitive vibration sensor but instead of restricting unwanted movements of the weight by utilizing restricting members which contact the weight, the prior art either compensates for the unwanted movements by utilizing a split electrode in place of the single electrode disclosed (such that a differential capacitance is measured) or utilizes slits within the diaphragm itself to limit the unwanted movements of the weight. Others utilize the "unwanted" movements to determine vibrations along an axis different from the axis perpendicular to the diaphragm electrode.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Seegmiller (US 3,352,157)** discloses an inertia diaphragm pressure transducer with corrugations in the diaphragm electrode.

**Iwasaki (US 4,338,823)** teaches a vibration sensor utilizing a weight and corrugations in the moveable diaphragm electrode.

**Nagasaki (JP 03112170 A)** discloses an acceleration sensor having a capacitor consisting of a fixed electrode facing to an electrode on a silicon diaphragm with a seismic mass attached to the diaphragm.

**Nakagawa et al. (US 5,798,460)** discloses a vibration sensor employing a flexible diaphragm and an electret film.

**Suzuki et al. (WO 2004/019049 A1)** discloses a capacitance acceleration sensor with a mushroom shaped weight.

**Sugimori et al. (US 2006/0053888 A1)** discloses an acceleration sensor with a mushroom shaped weight.



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**Yasuda et al. (US 2006/0150739 A1)** discloses a vibration sensor with a diaphragm electrode with an attached weight and situated between two fixed electrodes.

**Yamamoto et al. (US 7,194,905 B2)** discloses an acceleration sensor with a T-shaped weight on the diaphragm electrode.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M. Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Friday, 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



RMM

16 December 2007



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